Case Report

# Neonatal dengue with enterococcus sepsis

**Sanya Chopra[1], Saurabh Kapoor[2], Suksham Jain[3], Deepak Chawla[4]**

*From [1]Junior Resident, [3]Professor, [4]Associate Professor, Department of Pediatrics and Neonatology, Government Medical College and Hospital, Chandigarh, [2]Consultant, Department of Pediatrics and Neonatology, Kare Partner's Hospital, Panchkula, Haryana, India*

**Correspondence to:** Dr. Saurabh Kapoor, House number 2119, Sector 27 C, Chandigarh, India. E-mail: drsaurabhkapoor88@gmail.com

Received – 21 May 2018 Initial Review – 14 June 2018 Accepted – 01 July 2018

## ABSTRACT

Dengue infection is possible in all the three trimesters of pregnancy and is associated with various maternal and neonatal complications. The occurrence of subclinical infections may lend further confusion to the situation. Here, we report a case of neonatal dengue diagnosed with dengue NS1 antigen positive and IgM positive followed by secondary sepsis with *Enterococcus faecium*. Case studies like these may contribute to increased awareness of the suspicion of the associated life-threatening infections that can occur with neonatal dengue, their manifestations, and the management, thus improving their outcome.

**Key words:** *Dengue, Management, Neonate, Secondary sepsis*

Dengue during pregnancy has been associated with various maternal and neonatal complications including perinatal death, miscarriage, low birth weight, and preterm delivery. To date, very few cases of vertical dengue infection have been identified. Globally, a recent estimate indicates 390 million dengue infections per year, of which 96 million manifest clinically (with any severity of disease) [1]. As per the World Health Organization, in 2015, Delhi recorded its worst outbreak since 2006 with over 15,000 cases. Dengue in infancy constituted 20% of total dengue virus infections in an outbreak in Chennai, India [2]. However, no recent studies on the incidence of neonatal dengue have been done, suggesting a lack of data for the same.

Dengue infection is possible in all the three trimesters of pregnancy with the maximum transmission being reported in the third trimester [3]. This increases the risk of transmission of viremia, and the lack of protective maternal antibodies is responsible for the further manifestations of dengue including fever, thrombocytopenia, fluid leak, and shock. The incubation period of dengue virus in humans is 3–10 days, and its half-life in the neonate is 40 days [4,5]. The occurrence of subclinical infections may lend further confusion to the situation. Taking into account the complications associated, early recognition of congenital dengue will significantly reduce maternal and infant mortality. Vigilant monitoring and proper hydration along with appropriate laboratory investigations help in diagnosis and lead to an uneventful recovery. Here, we report a case of neonatal dengue diagnosed with dengue NS1 antigen positive and IgM positive followed by secondary sepsis.

## CASE REPORT

A 25-year-old primigravida delivered a female child at 39 weeks of gestation with a birth weight of 2.8 kg, by a lower segment cesarean section in view of fetal distress on October 27, 2017 at 11.13 pm. The baby was born vigorous with a thick meconium stained liquor. The APGAR was 8 at 1 min and 9 at 5 min. The mother had an antenatally booked and supervised pregnancy with no associated risk factors. She developed a high-grade fever with myalgia and arthralgia, 12 days before delivery.

Complete blood counts revealed thrombocytopenia and dengue NS1Ag was positive, following which she was referred to our hospital. Here, she was managed symptomatically with intravenous fluids, antipyretics, regular vital monitoring, and also transfused 4 units of platelet concentrate. In view of fetal distress, an emergency cesarean section was done within 10 h of admission.

The baby was born on day 13 of maternal illness and developed respiratory distress soon after birth in the form of tachypnea. On examination, the baby had hepatomegaly with petechial rash present over the face and trunk. The baby was managed symptomatically with intravenous fluids and oxygen by a hood. As the respiratory distress worsened by 12 h of life, the baby was treated with nasal continuous positive airway pressure support.

A chest X-ray done revealed bilateral pleural effusion. Blood counts revealed thrombocytopenia with a platelet count of 70,000 and dengue NS1Ag came out to be positive. The first sepsis screen sent at 18 h of life also came out to be positive with a c-reactive protein of 41 mg/dl. In view of further worsening, the baby was treated with nasal intermittent mandatory ventilation (IMV) mode at 18 h of life and continued with the same for the next 48 h. The child eventually developed shock requiring inotropic support. Blood culture and sensitivity came out to be positive for *Enterococcus faecalis*, sensitive to colistin.

Intravenous antibiotics were given as per culture sensitivity. Cerebrospinal fluid examination was done and was within the normal limits. As shock became passive by 72 h of life, orogastric feeds were started. The respiratory distress also settled, and the baby was gradually weaned from nasal IMV mode to room air over the next 48 h.

In view of the sick condition of the baby with shock requiring inotropic support, respiratory distress, and thrombocytopenia, she received two units of platelet concentrate on day 2 and day 3 of life at a platelet count of 35,000 and 49,000, respectively. Dengue IgM came out to be positive and dengue IgG negative. The baby recovered well, was continued on intravenous antibiotics for 14 days, and discharged thereafter on breastfeeds with an uneventful recovery. The follow-up visits done at 48 h, 1 week, and 1 month after discharge were also normal.

## DISCUSSION

Subclinical infection, lack of awareness, and the lack of good laboratory tests for early confirmation of acute dengue contribute to the low reporting of such cases. Diagnosis is confirmed with laboratory tests such as dengue virus isolation, nucleic acid identification, and other serological tests. Here, in this case, the mother was positive for dengue NS1 Ag and the baby for NS1 and dengue IgM both. The mother had severe dengue, which could have resulted in fetal distress leading to meconium aspiration. With no other significant maternal risk factors for sepsis, the child presented with thrombocytopenia and petechial rash on day 1 of life with a positive dengue NS1 Ag test. Dengue NS1 Ag strip sensitivity ranges from 77 to 80% with 100% specificity [6], and all these factors thus support the diagnosis of neonatal dengue. However, as the sepsis screen and blood culture sensitivity came out to be positive, the possibility of secondary sepsis superimposed on neonatal dengue was kept. Even though NS1 tests have been reported to be less sensitive in secondary dengue, little is known about the causes of false-positive NS1 tests, except for possible cross-reactivity with other flaviviruses and possibly, cytomegalovirus. However, in our case, both dengue NS1 antigen and IgM were positive [7,8]. The reports suggest that dengue patients are more vulnerable to bloodstream invasion by bacteria from the intestinal tract, especially *Enterococcus faecium*.

One of the mechanisms proposed to explain this coinfection involves the lesion of the digestive epithelial barrier, possibly through endothelial damage or intestinal hemorrhage. Bacteria in the damaged guts may leak into circulation and cause sepsis. The levels of lipopolysaccharide in the serum of dengue patients have been correlated with disease severity. This hypothesis, however, needs to be further explored [9]. Other microorganisms that have been identified as occurring simultaneously with dengue virus infection include *Escherichia coli*, *Salmonella* species, *Streptococcus pneumoniae*, *Mycobacterium tuberculosis*, *Mycoplasma pneumoniae*, *Shigella sonnei*, *Klebsiella pneumoniae*, *Klebsiella ozaenae*, *Moraxella lacunata*, *Staphylococcus aureus*, *Roseomonas* species, *Haemophilus influenzae*, *Candida tropicalis*, and c suggesting a predominance of intestinal flora microorganisms in such cases [10-12].

In addition, pathophysiological changes of the vascular and hemostatic system observed in dengue may predispose to complicating infections. Finally, the occurrence of bacterial infection superimposed on the dengue virus infection might occur as a mere temporal coincidence or, more likely, has the ways paved by a supposed immunosuppression caused by the virus. The presence of generalized petechial rash, tachycardia, shock, and respiratory distress requiring mechanical intervention can be caused by dengue, sepsis, and sometimes a dual infection that is the presence of both.

## CONCLUSION

Clinicians should be very vigilant to unusual manifestations of dengue fever, which may signalize a concomitant infection by other microorganisms, mainly bacteria. Case studies like the one reported here may contribute to increased awareness of these associated life-threatening infections and their better management, thus improving the outcome.

## REFERENCES


1. Bhatt S, Gething PW, Brady OJ, Messina JP, Farlow AW, Moyes CL, *et al*. The global distribution and burden of dengue. Nature 2013;496:504-7.
2. Kabilan L, Balasubramanian S, Keshava SM, Thenmozhi V, Sekar G, Tewari SC, *et al.* Dengue disease spectrum among infants in the 2001 dengue epidemic in Chennai, Tamil Nadu, India. J Clin Microbiol 2003;41:3919-21.
3. Waduge R, Malavige GN, Pradeepan M, Wijeyaratne CN, Fernando S, Seneviratne SL, *et al.* Dengue infections during pregnancy: A case series from Sri Lanka and review of the literature. J Clin Virol 2006;37:27-33.
4. Chan M, Johansson MA. The incubation periods of dengue viruses. PLoS One 2012;7:e50972.
5. Watanaveeradej V, Endy TP, Samakoses R, Kerdpanich A, Simasathien S, Polprasert N, *et al.* Transplacentally transferred maternal-infant antibodies to dengue virus. Am J Trop Med Hyg 2003;69:123-8.
6. Chaterji S, Allen JC Jr. Chow A, Leo YS, Ooi EE. Evaluation of the NS1 rapid test and the WHO dengue classification schemes for use as bedside diagnosis of acute dengue fever in adults. Am J Trop Med Hyg 2011;84:224-8.
7. Wang SM, Sekaran SD. Evaluation of a commercial SD dengue virus NS1 antigen capture enzyme-linked immunosorbent assay kit for early diagnosis of dengue virus infection. J Clin Microbiol 2010;48:2793-7.
8. Fry SR, Meyer M, Semple MG, Simmons CP, Sekaran SD, Huang JX, *et al.* The diagnostic sensitivity of dengue rapid test assays is significantly enhanced by using a combined antigen and antibody testing approach. PLoS Negl Trop Dis 2011;5:e1199.
9. van de Weg CA, Koraka P, van Gorp EC, Mairuhu AT, Supriatna M, Soemantri A, *et al.* Lipopolysaccharide levels are elevated in dengue virus infected patients and correlate with disease severity. J Clin Virol 2012;53:38-42.
10. Lee IK, Liu JW, Yang KD. Clinical characteristics and risk factors for concurrent bacteremia in adults with dengue hemorrhagic fever. Am J Trop Med Hyg 2005;72:221-6.
11. Pancharoen C, Thisyakorn U. Coinfections in dengue patients. Pediatr Infect Dis J 1998;17:81-2.
12. Parameswaran P, Liu Y, Roskin KM, Jackson KK, Dixit VP, Lee JY, *et al.* Convergent antibody signatures in human dengue. Cell Host Microbe 2013;13:691-700.


*Funding: None; Conflict of Interest: None Stated.*

**How to cite this article:** Chopra S, Kapoor S, Jain S, Chawla D. Neonatal dengue with enterococcus sepsis. Indian J Case Reports. 2018;4(4):281-282.

Doi: 10.32677/IJCR.2018.v04.i04.009